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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,911	03/11/2004	Richard Lee Donze	ROC920030185US1	7000

7590 12/14/2006  
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EXAMINER

CLARK, CHRISTOPHER JAY

ART UNIT PAPER NUMBER

2112

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/798,911

Applicant(s)

DONZE ET AL.

Examiner

Christopher J. Clark

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 3/11/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 1-10 and 20-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/11/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-10, drawn to a thermal sensor and regulator for controlling voltage classified in class 361, subclass 18.
  - II. Claims 11-19, drawn to a method for utilizing a thermal sensor for detecting and handling a thermal fault, classified in class 361, subclass 103.
  - III. Claims 20-23, drawn to method for computing a rate of temperature increase, classified in class 361, subclass 103.
2. The inventions are distinct, each from the other because of the following reasons:
3. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require the detection of a thermal fault and aims only at improving the timing margin of one or more delay paths on a semiconductor chip. The subcombination has separate utility such as the detection of a thermal fault on a semiconductor device.
4. The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found

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allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104.

See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

5. Inventions I and III are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require the computation of the rate of temperature increase. The subcombination has separate utility such as the computation of the rate of temperature increase.

6. The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

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7. Inventions II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination III has separate utility such as the computation of the rate of temperature increase. See MPEP § 806.05(d).

8. The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

9. During a telephone conversation with Robert Williams on December 4, 2006 a provisional election was made without traverse to prosecute the invention of a method for utilizing a thermal sensor for detecting a thermal fault (II), claims 11-19. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-10 and 20-23 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Specification***

10. The disclosure is objected to because of the following informalities: the phrase “distributed using distributed on a computer readable media” on Page 20 Line 1 and Page 22 Line 8 should be changed to “distributed using a computer readable media” or “distributed on a computer readable media.”

Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

11. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

12. Claim 19 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The subject matter claimed pertains to a “program product” which is not recorded on some computer-readable medium and does not fall within a statutory category of invention because it is not limited to a process, machine, manufacture, or a composition of matter.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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14. Claims 11, 12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Browning et al (U. S. Patent 6,415,388) in view of Beard (U.S. Patent 6,928,559).

15. In re Claim 11, Browning et al teaches the following method of improving timing margin of at least one path on a semiconductor chip (110 of Figure 4) coupled to a voltage supply (120 of Figure 4) comprising the following steps as shown in Figure 6:

- Operating the semiconductor chip at a first voltage value of the voltage supply (every voltage supply is inherently going to have an initial voltage value upon activation and it would be within skill of one in the art to select a voltage that falls within the operating parameters of the semiconductor to provide initial activation of the chip without causing damage due to excessive supply voltage)
- Detecting if a thermal fault exists (step 330)
- If a thermal fault is detected, lowering the voltage supply to a second voltage value lower than the first voltage value (step 350)
- If a thermal fault is not detected, raising the voltage supply to a third voltage value higher than the first voltage value (step 360)

16. The teaching of Browning et al has been discussed above, but does not disclose waiting for the elapse of a first predetermined time interval before raising the voltage supply to a third voltage value higher than the first voltage value if a thermal fault is not detected.

17. Beard teaches waiting a time period before adjusting the supply voltage in response to input from a temperature sensor (Column 7 Lines 7-9).

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18. The advantage of waiting a time period before making adjustments to the supply voltage allows the computing device in charge of varying the voltage supply time to respond to the changes and allow any hysteresis characteristics to disperse (Column 7 Lines 4-12).

19. Browning et al discloses the claimed invention except for the additional limitation of waiting for the elapse of a first predetermined time interval before raising the voltage supply to a third voltage value higher than the first voltage value if a thermal fault is not detected. It would have been obvious to one having ordinary skill in the art at the time the invention was made to wait a first predetermined time interval before raising the voltage supply as taught by Beard since Beard states that such a modification would allow the computing device in charge of varying the voltage supply time to respond to the changes and allow any hysteresis characteristics to disperse (Column 7 Lines 4-12).

20. In re Claim 12, the method disclosed by Browning et al as discussed above discloses reducing the voltage whenever the temperature exceeds a limit value as seen in step 350. According to Browning et al's invention, after reducing voltage a first time when step 350 is carried out, it will eventually return to step 330 and determine if the temperature is over a limit. If the temperature is still above a limit, it will again reduce the voltage in step 350. Therefore, Browning et al discloses the process of subsequently lowering the voltage supply after an initial voltage lowering. The teaching of Beard involves waiting a time period between taking action, such as reducing the supply voltage. Browning et al as modified by Beard as discussed above would therefore teach placing a time delay between the subsequent reductions of the supply voltage.



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21. Browning et al as modified by Beard discloses the claimed invention except for the time period between reducing the voltage being a specific second predetermined time interval. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a second predetermined time interval between subsequent reduction of the supply voltage since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

22. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Browning et al (U. S. Patent 6,415,388) in view of Beard (U.S. Patent 6,928,559) as applied to claim 11 above, and further in view of Temperature Sensor and System Monitor in a 10-Pin microMAX by MAXIM.

23. In re Claims 13, the teaching of Browning et al as modified by Beard has been discussed above, but does not disclose reading product data on a storage on the semiconductor chip.

24. MAXIM discloses using programmed threshold data being read to compare to incoming voltage and temperature measurements (Page 1 Lines 6-11). MAXIM discloses these values being available in a storage (Page 7 Column 2 Lines 18-20 and Page 8 Column 1 Lines 4-7).

25. The advantage of reading product data from a storage is to have threshold limit values to compare incoming measured values (Page 1 Lines 8-11).

26. Browning et al as modified by Beard discloses the claimed invention except for the reading of product data from a storage. It would have been obvious to one having ordinary skill in the art at the time the invention was made to read product data from storage as taught by

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MAXIM since MAXIM states that such a modification would provide threshold limit values to compare incoming measured values (Page 1 Lines 8-11).

27. In re Claim 14 and 16, MAXIM discloses the use of a low limit voltage value and a high limit voltage value used as threshold values (Page 8 Column 1 Lines 4-7).

28. In re Claim 15, MAXIM discloses a fault signal being activated if the voltage is less than a low limit voltage (Page 8 Column 1 Lines 5-6). The invention of Browning et al as discussed above continuously reduces voltage when a temperature threshold is crossed. If the voltage were to be reduced to a low limit value, the temperature could no longer be lowered through the reduction of the voltage. Identifying the supply voltage reaching a low limit voltage according to the invention of Browning et al would synonymously identify an uncorrectable thermal fault as the temperature could no longer be reduced through reduction of the voltage. Therefore, Browning et al as modified by Beard would signify an uncorrectable fault.

29. In re Claim 17, Browning et al as modified by Beard and MAXIM discloses the claimed invention except for not increasing the supply voltage greater than the high limit voltage value. It would have been obvious to one having ordinary skill in the art at the time the invention was made to not increase the supply voltage greater than the high limit voltage value since it was known in the art that increasing the voltage supplied to a semiconductor chip greater than its rated value could cause damage to the chip and compromise its functionality.

30. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Browning et al (U. S. Patent 6,415,388) in view of Beard (U.S. Patent 6,928,559) as applied to claim 11 above, and further in view of Hobson (U. S. Patent 6,112,164).

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31. The teaching of Browning et al as modified by Beard has been discussed above, but does not disclose the step of changing the first predetermined time interval to a second predetermined time interval.

32. Hobson teaches the use of a programmable timer to provide a system management interrupt at a specific interval (Column 2 Lines 39-41). One skilled in the art at the time the invention was made would realize that the programmable timer is capable of having its timing interval changed.

33. The advantage of having a programmable timer that is capable of changing time intervals is to manage the different hysteresis characteristics that may exist in different thermal situations (system temperature rising, system temperature falling, etc.) with time delay as discussed in Beard (Column 7 Lines 4-12) and referenced above.

34. Browning et al as modified by Beard discloses the claimed invention except for the step of changing the first predetermined time interval to a second predetermined time interval. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide the claimed invention of Browning et al as modified by Beard with a programmable timer as taught by Hobson in order to change a first predetermined time interval to a second predetermined time interval in order to manage the different hysteresis characteristics that may exist in different thermal situations with time delay.

### ***Conclusion***

35. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Georgiou et al (U. S. Patent 5,940,785) discloses a system using thermal feedback to

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adjust supply voltage and frequency. Cooper et al (U. S. Patent 6,233,190) discloses storing a temperature threshold value in an integrated circuit. Pippin (U. S. Patent 6,630,754) discloses a system that includes a temperature sensor, a register for storing a temperature threshold value, and outputs an interrupt if a temperature threshold is crossed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher J. Clark whose telephone number is 571-270-1427. The examiner can normally be reached on M-F, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Nguyen can be reached on 571-272-4491. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



CJC  
12/6/2006

JAMES A. REAGAN  
PRIMARY EXAMINER

